

<b>PRE-APPEAL BRIEF REQUEST FOR REVIEW</b>		Docket Number (Optional): <div style="text-align: center;">276440-21</div>	
I hereby certify that this correspondence is being facsimile transmitted to the USPTO at (571) 273-8300 or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on <u>June 6, 2006</u> .  <div style="border-top: 1px solid black; width: 300px; margin-top: 20px;"></div> Erin Cowles	Application Number: <div style="text-align: center;">10/027,476</div>	Filed: <div style="text-align: center;">December 21, 2001</div>	
	First Named Inventor: <div style="text-align: center;">Chen et al.</div>		
	Art Unit: <div style="text-align: center;">3729</div>	Examiner: <div style="text-align: center;">Donghai D. Nguyen</div>	

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).  
Note: No more than five (5) pages may be provided.

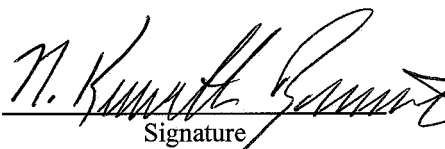
I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest.  
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.  
(Form PTO/SB/96)

☒ attorney or agent of record.  
Registration number: 39,923

☒ attorney or agent acting under 37 CFR 1.34.  
Registration number if acting under 37 CFR 1.34: 39,923

  
 Signature  


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 N. Kenneth Burraston  
 Typed or printed name  


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 (801) 323-5934  
 Telephone number  


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 June 6, 2006  
 Date

Note: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below\*.

\*Total of 5 page(s) of supporting arguments are attached.

## **ARGUMENTS SUPPORTING PRE-APPEAL BRIEF REQUEST FOR REVIEW**

In support of Applicants' Pre-Appeal Brief Request For Review of the final rejection in the Office Action dated March 6, 2006 (hereinafter the "Final Office Action") in the above-identified patent application, Applicants respectfully submit the following:

### **I. Background**

In the Final Office Action, claims 26-29 were rejected under the first and second paragraphs of 35 USC 112. In addition, claims 1-5, 7, 10, and 16 were rejected under 35 USC 102(b) as anticipated by US Patent No. 4,983,804 to Chan et al. ("Chan"), and claims 1-5, 7-10, 13-16, 18-22, and 24-28 were rejected under 35 USC § 103(a) as obvious in view of US Patent No. 6,150,186 to Chen et al. ("Chen") in combination with Chan or US Patent No. 5,418,811 to Ruffini et al. ("Ruffini"). Claim 12 was also rejected under 35 USC § 103(a) as obvious in view of Chen, Chan, and US Patent No. 5,340,537 to Barrett ("Barrett"), and claim 17 was rejected under 35 USC § 103(a) as obvious in view of Chen, Chan, and US Patent No. 5,476,211 to Khandros ("Khandros"). Claim 29 was rejected under 35 USC 103(a) as obvious in view of Chen and US Patent No. 6,184,053 to Eldridge et al. ("Eldridge").

### **II. Argument**

#### **A. Claims 26-29**

Although Applicants disagree with the rejections of claims 26-29, for purposes of the Pre Appeal Brief Conference, Applicants do not contest the rejection of claims 26-29 under 35 USC 112, paragraphs 1 and 2. Accordingly, upon resolution of the rejection of claims 1-25 by the Pre Appeal Brief Conference, Applicants will cancel claims 26-29, mooted all of the rejections of those claims. Applicants reserve the right, however, to pursue claims 26-29 in a continuation application.

#### **B. Rejection Of Claim 1 On Grounds Of Anticipation**

Independent claim 1 was rejected under 35 USC 102(b) as anticipated by Chan. Applicants respectfully traverse this rejection on the grounds that Chan does not teach or suggest several aspects of claim 1.

Claim 1 requires "permanently chang[ing] a mechanical operating property of the interconnect structure." Without citing supporting reasons or evidence, the PTO asserted that briefly melting solder permanently changes mechanical operating properties of the solder. (See Final Office Action, pg. 11; see also the Office Action dated September 9, 2005 (hereinafter "the Office Action") pg. 4.) The PTO, however, is mistaken. The process of heating solder to its melting point and then allowing the solder to cool back to room temperature (as disclosed in Chan) does not permanently change a mechanical operating property of the solder. The solder is briefly melted and then quickly re-solidifies. The mechanical operating properties of the solder after it re-solidifies are the same as before the solder was melted. Because briefly melting solder does not permanently change any mechanical operating properties of the solder, Chan fails to anticipate or render obvious claim 1.

Moreover, even assuming solely for the purpose of argument that briefly melting solder changes its mechanical operating properties, Chan still would not meet the requirements of claim 1. This is because claim 1 requires that the oscillating field heat the structure *whose mechanical properties are changed*. Chan's electromagnetic field does not heat solder 17, 32, 33. Rather, Chan's electromagnetic field heats sheet 19 of Figure 2 or balls 30, 31 of Figure 4. Solder 17, 32, 33 is heated by conduction of heat from sheet 19 or balls 30, 31. Nothing in Chan teaches or suggests that a property of sheet 19 or balls 30, 31 is changed. Thus, even if briefly melting solder were deemed to change mechanical operating properties of the solder—which, as discussed above, Applicants assert is incorrect—Chan still would not meet the requirements of claim 1, which requires that the oscillating field heat the structure *whose mechanical properties are changed*.<sup>1</sup>

C. Rejection Of Claim 1 On Grounds Of Obviousness

Claim 1 was rejected under 35 USC § 103(a) as obvious in view of US Patent No. 6,150,186 to Chen et al. ("Chen") in combination with Chan or US Patent No. 5,418,811 to Ruffini et al. ("Ruffini"). Applicants respectfully traverse these rejections on two grounds. First, the prior art lacks motivation to combine Chen with Chan or Ruffini. Second, even if combined, Chen and Chan or Ruffini would not meet all of the requirements of claim 1.

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<sup>1</sup> Similar arguments were made on pages 6 and 7 of the Amendment dated January 9, 2006 (hereinafter "the Amendment").

1. The Prior Art Lacks Motivation to Combine Chen With Chan Or Ruffini

As mentioned above, independent claim 1 requires heating "the interconnect structures *without substantially heating the substrate*" to which the interconnect structures are attached. The PTO acknowledges that "Chen et al. is silent regarding how the contact is subjected to heat treatment" and therefore does not teach "heating the interconnect structures *without substantially heating the substrate*." To make up for this deficiency in Chen, the PTO relies on Chan and Ruffini.

The prior art, however, contains no suggestion or motivation that would lead a person of ordinary skill in the field to utilize Chan's solder melting system or Ruffini's melting system to heat treat Chen's contact structures 212.

Chen does not provide any teaching or even the slightest hint that base 202 should not be heated or that there is any advantage to not heating base 202 (although claims in Chen may be broad enough to cover not heating the base 202). Thus, there is no motivation in Chen that would lead to heating Chen's contact structures 212 without also heating Chen's substrate 202.

Chan—which discloses a system for melting selected solder joints on an electronics module—likewise lacks a suggestion or motivation that would lead to a combination with Chen. Chan teaches one advantage for the use of his electromagnetic inductive heating system: melting one solder joint on a substrate without melting other solder joints on the substrate. (Chan title; abstract; col. 1, lines 6-7.) There is no need, however, in Chen to selectively melt one solder joint without melting another solder joint. Therefore, a person skilled in the field would not have been motivated to utilize Chan's solder melting system to heat Chen's contact structures 212.

Ruffini's system is for disposing of unwanted objects by melting the objects. As shown in Figure 1, objects to be melted are placed in crucible 12. Ruffini would only be useful to Chen if Chen wanted to destroy the base 202 and contact structure 212 by melting them. There is, thus, no suggestion or motivation in Ruffini that would lead a person of ordinary skill in the field to utilize Ruffini's melting system to heat Chen's contacts 212.

Contrary to the assertion by the PTO, the six advantages of induction heating mentioned in the background section of Ruffini at column 1, lines 37-61 would not motivate use of induction heating to heat Chen's contacts 212 without substantially heating Chen's substrate 202. The first advantage and the third through sixth advantages merely state that induction heating is

fast, controllable, easily automated, requires a short start up time, and is clean (e.g., does not give off fumes). None of these advantages would motivate selective heating of Chen's contact structure 212 without substantially heating substrate 202.

Likewise, the second advantage mentioned in Ruffini merely mentions the unremarkable fact that the size and shape of an inductor coil determines the area on an object that will be heated by the coil. The mere fact that the area heated by an inductor coil depends on the shape of the coil would not lead a person skilled in the field to heat only Chen's contact structures 212 without also heating Chen's substrate 202.

Thus, none of Chen, Chan, or Ruffini provides any teaching, suggestion, or motivation that would lead a person to heat only Chen's contact structure 212 without substantially heating Chen's substrate 202. Indeed, the only teaching or suggestion to heat contact structures without heating the substrate to which the contact structures are attached is in Applicant's specification. Thus, the combination of Chen and Chan or Ruffini is based solely on impermissible hindsight and is therefore improper.<sup>2</sup>

2. Even If Combined, Chen And Chan Or Ruffini Would Not Meet All Of The Requirements Of Claim 1

The rejection of claim 1 should also be withdrawn on the further grounds that, even if Chan's solder melting system or Ruffini's object melting system were to be combined with Chen as proposed by the PTO, the combination would not teach all of the requirements of claim 1.

Claim 1 includes "maintaining the contactor in the oscillating electromagnetic field until each of the interconnect structures obtains a defined heat-treatment temperature substantially greater than an ambient temperature for a predetermined period of time sufficient to permanently change a mechanical operating property of the interconnect structure." Chan's solder melting system is not designed to and, indeed is not able to, provide or maintain heat sufficient "to permanently change a mechanical operating property of the interconnect structure," as required by claim 1. Chan's solder melting system provides a very imprecise temperature (e.g., varying as widely as 200-400°C) for only a very short period of time (e.g., less than 20 seconds). (See Chan col. 2, line 64 through col. 3, line 1.) The solder is temporarily melted but then quickly

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<sup>2</sup> Similar arguments were made on pages 8 and 9 of the Amendment (dated January 9, 2006).

returns to its original sold state; no permanent change to the mechanical operating properties of the solder occurs. As discussed above, all that Ruffini's system could be used for is to melt Chen's substrate 202 and contact structure 212. Thus, even if Chen were to be combined with Chan or Ruffini, the combination would fail to disclose all of the requirements of claim 1.

For this additional reason, claim 1 is patentable over Chen, Chan, and Ruffini, and the rejection should be withdrawn.<sup>3</sup>

D. Dependent Claims

All other pending claims—namely, claims 2-12, 16-22, 24, and 25—depend from claim 1 and are therefore patentable over Chen, Chan, and Ruffini at least because of their dependency on claim 1.

**III. Conclusion:**

In view of the foregoing, Applicants respectfully submit that the rejection of claims 1-12, 16-22, 24, and 25 should be withdrawn and all pending claims allowed.

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<sup>3</sup> Similar arguments were made on pages 9 and 10 of the Amendment (dated January 9, 2006).